

positive stress echocardiogram probably reflects the effects of treatment.

### Interaction of arterial compliance with ischaemia

The extent of ischaemia reflects an interplay between supply and demand, and both are influenced by compliance. On the one hand, ejecting into a stiffer systemic tree increases cardiac load and myocardial oxygen consumption (increased demand).<sup>18</sup> On the other hand, a loss of compliance induces an increase in pulse pressure, resulting from an increase in systolic and a decrease in diastolic pressure.<sup>8</sup> The systolic pressure increase contributes to the increased cardiac load,<sup>18</sup> whereas the decrease in diastolic pressure reduces coronary perfusion (decreased supply).<sup>9</sup> Previous work has shown an association of compliance with exercise capacity and ischaemic threshold.<sup>13, 14</sup> In healthy people, exercise capacity is related to maximum cardiac output, which may be influenced by systemic compliance.<sup>13</sup> Indeed, Cameron *et al*<sup>19, 20</sup> already reported a correlation between lower arterial stiffness and higher levels of aerobic fitness.

However, in patients with CAD exercise capacity is related to myocardial ischaemia, the threshold of which is mainly determined by coronary perfusion and cardiac workload; thus, the interaction between supply and demand. A stiffer systemic vasculature may lower ischaemic threshold.<sup>14</sup> Kingwell *et al*<sup>14</sup> did not assess myocardial ischaemia with an imaging technique, as was done in the present study, but by means of evaluating the ST segment depression on the ECG during a treadmill test. Those investigators found that various measures of arterial stiffness (arterial compliance, pulse wave velocity, and augmentation index) inversely correlated with time to ischaemia, independent of potential confounding factors such as sex, age, or mean arterial pressure. Our data supplement these findings by showing that TAC was a predictor not only of peak WMS (ischaemia and resting dysfunction) but also of  $\Delta$ WMS (extent of ischaemia).

### Clinical implications

While traditional cardiovascular risk factors are strong predictors of ischaemia on stress echocardiography, reduction of TAC indicates the extent of ischaemia on stress echocardiography. Some clinical consequences may be anticipated: interventions such as smoking cessation, aggressive lipid lowering, hypertension control, and exercise may have a favourable impact on TAC and therefore improve ischaemia. Other associations, including the detection of ischaemia at lower workload or with less severe stenoses, and even the development of false positive scan results, warrant investigation in other cohorts.

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